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WHAT IS CLAIMED IS:

1. A method for removing a fluorine residue in a process chamber, the method comprising:

supplying an oxygen-containing gas into the process chamber;

supplying a hydrogen-containing gas into the process chamber;

producing a plasma of a mixture of the oxygen containing gas and the hydrogen-containing gas, so that the plasma reacts with the fluorine residue to form a fluorine containing gas; and

evacuating the fluorine containing gas from the process chamber.

2. The method of claim 1, wherein the hydrogen-containing gas is NH_3.

3. The method of claim 1, wherein the oxygen-containing gas is selected from a group consisting of N_2O, O_2, and air.

4. The method of claim 1, wherein producing the plasma exothermically generates H_2O, supplying heat to increase a rate of the reaction between the plasma and the fluorine residue.

5. The method of claim 1, wherein producing the plasma produces an ion flux to an interior surface of the process chamber, so that the ion flux results in an ion-enhanced chemical reaction between the plasma and the fluorine residue.

6. The method of claim 1, wherein producing the plasma generates a plurality of coordinately and electronically unsaturated radicals and ions that reacts with the fluorine residue.

7. The method of claim 1, wherein the mixture of the oxygen-containing gas and the hydrogen-containing gas is 70 mol % N_2O/NH_3.

8. The method of claim 7, wherein a flow rate of NH_3 into the process chamber is 1,500 sccm.

9. The method of claim 7, wherein a flow rate of N_2O into the process chamber is 3,500 sccm or less.

10. The method of claim 7, wherein producing the plasma uses a high frequency RF power of 3,000W, and a pressure of the process chamber is 2 Torr.

11. The method of claim 1, wherein the mixture of the oxygen-containing gas and the-hydrogen containing gas is 50 mol % N_2O/NH_3.

12. The method of claim 11, wherein a flow rate of NH_3 into the process chamber is 1,500 sccm.

13. The method of claim 11, wherein a flow rate of N_2O into the process chamber is 3,500 sccm or less.

14. The method of claim 11, wherein producing the plasma uses a high frequency RF power of 3,000W, and a pressure of the process chamber is 2 Torr.

15. The method of claim 1, wherein the mixture of the oxygen-containing gas and the hydrogen-containing gas is 52 mol % O_2/NH_3.

16. The method of claim 15, wherein a flow rate of NH_3 into the process chamber is 2,000 sccm.

17. The method of claim 15, wherein a flow rate of N_2O into the process chamber is 2,170 sccm or less.

18. The method of claim 15, wherein producing the plasma uses a high frequency RF power of 2,000W, and a pressure of the process chamber is 3 Torr.

19. The method of claim 1, further comprising supplying an inert gas to stabilize the plasma.

20. The method of claim 19, wherein the inert gas is selected from a group consisting of He, Ne, Ar, and Kr.

21. The method of claim 1, wherein the process chamber is a chemical vapor deposition chamber.